ASP-CATx1RS

HDMI Single CAT Extender
with
Bi-Directional IR & RS-232

User Manual

Manual Number: 120625

Full HD 1080 | HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE | HDCP HIGH-DEFINITION CONTENT PROTECTION | 7.1 CH AUDIO | CAT-5e/6/7 SINGLE PATENTED | RoHS Compliance | FC | CE

Aurora Multimedia

Safety and Notice

The **ASP-CATX1RS HDMI** has been tested for conformity to safety regulations and requirements, and has been certified for international use. However, like all electronic equipment, the ASP-CATX1RS should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

Introduction

The ASP-CATX1RS HDMI over Single CAT6 Extender with RS-232, IR, and Auto EDID learning boosts up your video/audio transmission distance up to 60m (200ft) in HDTV 1080i format, 40m (130ft) in HDTV 1080p format,(24 bit) and 20m (65ft) in HDTV 1080p with 36-bit color depth. ASP-CATX1RS also supports the most advanced 3D video format complaint with HDMI 3D specification and therefore guarantees the highest 3D video compatibility on the market. With only one cost effective Cat.5/5e/6 cable, users can readily extend HDTV sources from DVD players, Blu-ray Disc player, PS3, PC, and any other kinds of sources compliant with TMDS to distant display monitors including HDMI or DVI enabled TV sets or LCD PC monitors. With the advanced design for the latest HDMI technology, deep color video, DTS-HD or Dolby TrueHD audio, and HDCP supports and compatibility are all further insured. This flexibility makes HDCP compliant DVD players or PS3 transmit utmost high quality video and audio with a greater distance at the minimal cost, when integrating several components apart. In addition, ASP-CATX1RS is also equipped with bi-directional IR pass-through path. This bonus feature allows users to boost IR control distance up to 100m (330 ft) and makes IR control possible through only single Cat.5/5e/6 cable including HDMI signals.

The ASP-CATX1RS includes two units: transmitting unit ASP-CATX1RS-TX and receiving unit ASP-CATX1RS-RX. The transmitting unit is used to capture the input HDMI / DVI signals with IR control packets and carry the signals via one cost effective Cat.5/5e/6 cable. The receiving unit is responsible for equalizing the transmitted HDMI signal and reconstructing IR signals. The transmission distance between the sending and receiving units can be up to 60m (200ft) at HD 720p or 1080i; or 40m (130ft) at Full HD 1080p. With an 8-level equalization rotary control on the receiving unit, users can adjust the equalization strength to the received HDMI signals accordingly, and therefore optimize the transmission distance between source and destination.

Features

- HDMI 3D & Deep Color
- Extend the transmission up to 60m (200ft) from the HDMI source at HD 1080i or 720p 24-bit
- Extend the transmission up to 40m (130ft) from the HDMI source at Full HD 1080p 24-bit
- Extend the transmission up to 20m (65ft) from the HDMI source at Full HD 1080p 36-bit
- HDCP 1.1 compliant
- Minimize the cable skew by adjustable 8-level equalization control
- Auto EDID
- Pure unaltered uncompressed 7.1ch digital HDMI over Cat.5/5e/6 cable transmission
- DTS-HD and Dolby True HD high bit rate audio support
- Support full frequency IR signal from 20KHz to 60KHz
- Bi-directional IR path
- Full Duplex RS-232 up to 115k bps
- Allows cascading
- Wall mounting housing design for easy and robust installation
- Perfectly integrated with other HDMI over CAT series products

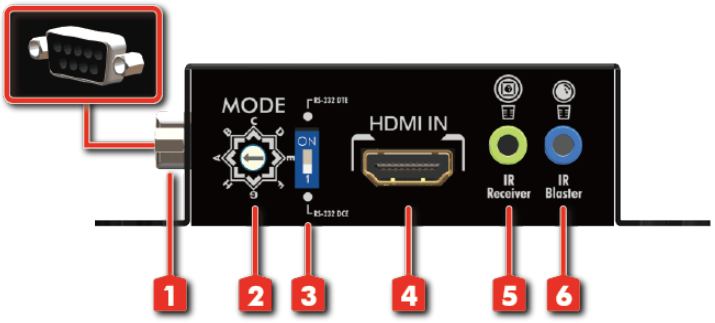
The length depends on the characteristics and quality of the cables. Higher resolutions and longer transmission distances require low skew cables (<25ns/100m) for best performance. Unshielded CAT6 with metal RJ-45 connectors is recommended.

Specifications & Package Contents

Model Name		ASP-CATX1RS	
Technical		ASP-CATX1RS-TX	ASP-CATX1RS-RX
Role of usage		Transmitter [TX]	Receiver [RX]
HDMI compliance		HDMI Deep Color & 3D	
HDCP compliance		Yes	
Video bandwidth		Single-link 225MHz [6.75Gbps]	
Video support		480i / 480p / 720p / 1080i / 1080p60	
HDMI transmission over LAN cable [24-bit]		Full HD (1080p 60Hz 24bit) 40m (130ft) [CAT6]) Full HD (1080p 60Hz 36bit 20m (65ft) [CAT6])	
		HD (720p/1080i)-50m (165ft) [CAT5e] / 60m (200ft) [CAT6]	
Audio support		Surround sound (up to 7.1ch) or stereo digital audio	
Signal level equalization		8-level digital control at RX	
Input TMDS signal		1.2 Volts [peak-to-peak]	
Input DDC signal		5 Volts [peak-to-peak, TTL]	
ESD protection		[1] Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge] [2] Core chipset — ±8kV	
PCB stack-up		4-layer board [impedance control — differential 100Ω; single 50Ω]	
Input		1x HDMI	1x RJ-45
Output		1x RJ-45	1x HDMI
HDMI output		Up to HDMI 1.4a	
HDMI connector		Type A [19-pin female]	
RJ-45 connector		WE/SS 8P8C with 2 LED indicators	
Rotary control switch		EDID Mode	Signal level Equalization
Mechanical		**ASP-CATX1RS**	
		TX	**RX**
Housing		Metal enclosure	
Dimensions [L x W x H]	Model [TX/RX]	71 x 91 x 35mm [2.8”x3.6”x1.4”]	
	Package	270 x 175 x 80mm [10.6” x 6.9” x 3.1”]	
	Carton	450 x 370 x 300mm (1’6” x 1’3” x 11.8”]	
Weight	Model		
	Package		
Fixedness		Wall-mounting case with screws	
Power supply		5V 2A DC	
Power consumption		1.5 Watt [max]	
Operation temperature		0~40°C [32~104°F]	
Storage temperature		-20~60°C [-4~140°F]	
Relative humidity		20~90% RH [no condensation]	
Package Contents		1x ASP-CATx1RS [TX & RX] 1x IR blaster 1x IR receiver 2x 5V power supply unit 1x User Manual	

Panel Descriptions

Front View — Transmitting Unit ASP-CATX1RS-TX

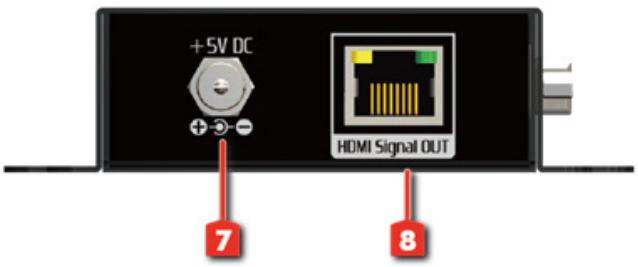


1. **RS-232: Connect to PC serial port with a DSUB-9 male-male cable here**
2. **MODE:**

   A - EDID Full-HD(1080p@60) - 24bit 2D video & 7.1ch audio
   B - EDID Full-HD(1080p@60) - 24bit 2D video & 2ch audio
   C - EDID Full-HD(1080p@60) - 24bit 3D video & 7.1ch audio
   D - EDID Full-HD(1080p@60) - 24bit 3D video & 2ch audio
   E - EDID HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 7.1ch audio
   F - EDID HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 2ch audio
   G - EDID Full-HD(1080p@60) - 36bit 2D video & 7.1ch audio
   H – Auto EDID learning

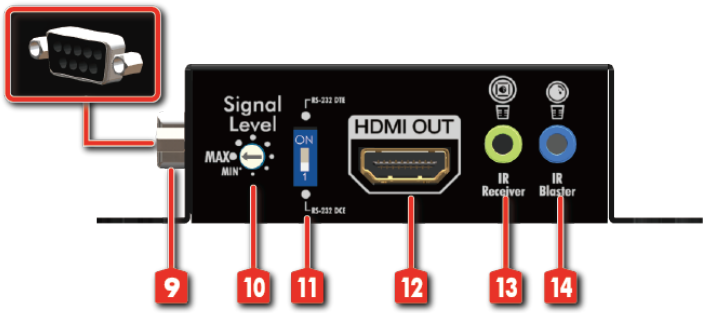
3. **Dip Switch: Setup the RS-232 mode for serial communication channel**
4. **HDMI IN:** Connects to a HDMI source with a HDMI male-male cable
5. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver
6. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster

Rear View — Transmitting Unit ASP-CATX1RS-TX



7. **+5V DC:** Connect to 5V DC power supply.
8. **HDMI Signal OUT:** Plug in a Cat-5/5e/6 cable to be linked to the transmitting unit ASP-CATX1RS-TX.

Front View — Receiving Unit ASP-CATX1RS-RX



9. **RS-232: Connect to PC serial port with a DSUB-9 male-male cable here**

10. **Signal Level:** Adjust the 8-level equalization control to the received HDMI signals. The HDMI signal level varies from MAX (strongest) to MIN (weakest) for respective transmission length from longest possible range to short distance. Please adjust the signal level from MIN to MAX and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!

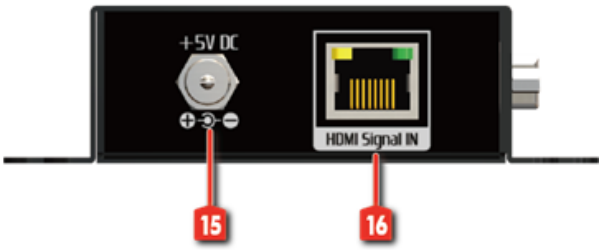
11. **Dip Switch: Setup the RS-232 mode for serial communication channel**

12. **HDMI OUT:** Connect to a HDMI display with a HDMI male-male cable.

13. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver

14. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster

Rear View — Receiving Unit ASP-CATX1RS-RX



15. **+5V DC:** Connect to 5V DC power supply.

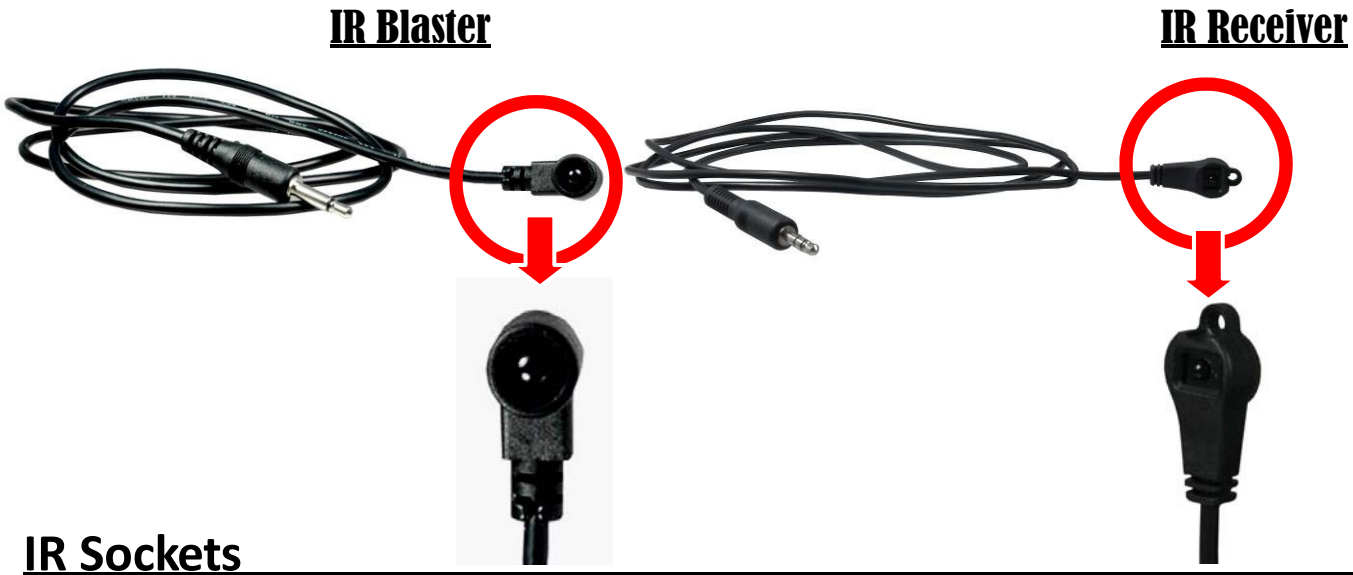
16. **HDMI Signal IN:** Plug in a Cat-5/5e/6 cable to be linked to the receiving unit ASP-CATX1RS-RX.

DIP Switch Position TX & RX	Description
ON [⬆]	*TxD: The 2nd pin of RS-232, which is in charge of receiving data* *RxD: The 3rd pin of RS-232, which is in charge of sending data*
OFF [⬇]	*TxD: The 3rd pin of RS-232, which is in charge of receiving data* *RxD: The 2nd pin of RS-232, which is in charge of sending data*

Hardware Installation

1. Connect a HDMI or DVI source (such as a Blu-ray Disc player) to the transmitting unit ASP-CATX1RS-TX.
2. Connect a HDMI or DVI display (such as a LCD TV) to the receiving unit ASP-CATX1RS-RX.
3. Connect IR Blaster/Receiver to both TX and RX units and or RS-232 connections.
4. Connect a Cat-5/5e/6 cable between the transmitting and receiving units.
5. Make sure this Cat-5/5e/6 cable is tightly connected and not loose.
6. Plug in 5V DC power supply unit to the power jack of the receiving unit ASP-CATX1RS-RX.
7. Plug in 5V DC power supply unit to the power jack of the transmitting unit ASP-CATX1RS-TX.
8. If you see flickering or blinking image on the display, please adjust the rotary control switch to improve the cable skew. 0 stands for the strongest HDMI signal level for longest possible transmission length while 7 stands for the weakest HDMI signal level for short transmission length. Please adjust the signal level from 7 to 0 and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!

IR Extenders

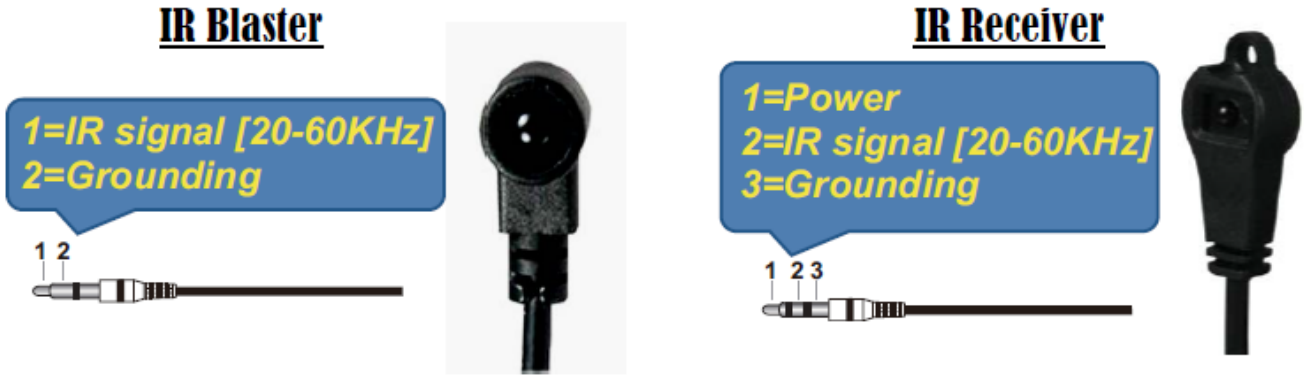


IR Sockets

IR Blaster: Plug in the IR blaster here to emit all IR command signals received from the IR receiver to control the HDMI source devices.

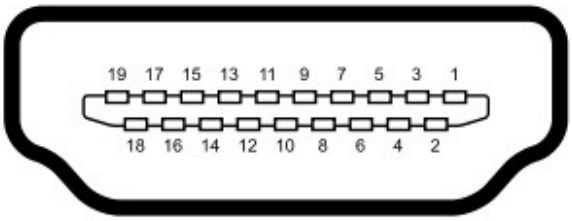
IR Receiver: Plug in the IR receiver here to receive all IR command signals from the IR remote controls of the HDMI source devices.

Caution!!! Wrongly insert IR blaster and IR receiver to wrong 3.5mm infrared sockets may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets.



You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.

HDMI

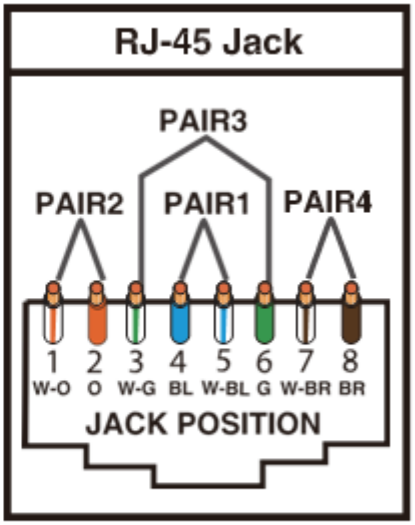


Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	Pin 8	TMDS Data0 Shield	Pin 15	SCL
Pin 2	TMDS Data2 Shield	Pin 9	TMDS Data0–	Pin 16	SDA
Pin 3	TMDS Data2–	Pin 10	TMDS Clock+	Pin 17	DDC/CEC Ground
Pin 4	TMDS Data1+	Pin 11	TMDS Clock Shield	Pin 18	+5 V Power
Pin 5	TMDS Data1 Shield	Pin 12	TMDS Clock–	Pin 19	Hot Plug Detect
Pin 6	TMDS Data1–	Pin 13	CEC		
Pin 7	TMDS Data0+	Pin 14	Reserved (N.C. on device)		

CAT 5/6 [RJ-45]

Data Link TIA/EIA-568-B		
PIN	Color	Function
1	W-O	TX0-
2	O	TX0+
3	W-G	TX1-
4	BL	TX2-
5	W-BL	TX2+
6	G	TX1+
7	W-BR	TXC-
8	BR	TXC+



Notice

1. All HDMI over CAT5 transmission distances are measured using Belden Cat-5e 125MHz LAN cable and ASTRODESIGN Video Signal Generator VG-859C. The transmission distance is defined as the distance between the transmitting unit (TX) and the receiving unit (RX).
2. The transmission length is largely affected by the type of LAN cables, the type of HDMI sources, and the type of HDMI display. The testing results show solid LAN cables (usually in bulk cable [300m/1000ft] style) can transmit signals a lot longer than stranded LAN cables (usually in patch cord style). Shielded STP cables are better suited than unshielded UTP cables. A solid UTP CAT5e cable shows longer transmission range than stranded STP CAT6 cable. For long transmission applications, solid UTP cables are the only viable choice.
3. EIA/TIA-568-B termination (T568B) for LAN cables is recommended for better performance.
4. To reduce the interference among the unshielded twisted pairs of wires in UTP cable, one can use shielded STP cables to improve EMI problems, which is worsen in long transmission.
5. Because the quality of the Cat-5/5e/6 cables has the major effect on how long the transmission limit can achieve and how good is the received picture quality, the actual transmission range is subject to one's choice of Cat-5/5e/6 cables. For desired resolutions greater than 1080i or 1280x1024, a Cat-6 cable is recommended.
6. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.

Performance Rating		**Type of Category Cable**		
Wiring	**Shielding**	**CAT5**	**CAT5e**	**CAT6**
Solid	Unshielded (UTP)	★★★	★★★★	★★★★★
	Shielded (STP)	★★★	★★★	★★★★
Stranded	Unshielded (UTP)	★	★★	★★
	Shielded (STP)	★	★	★★
Termination		Please use **EIA/TIA-568-B** termination (**T568B**) at any time		

Limited Warranty

Aurora Multimedia Corp. (“Manufacturer”) warrants that this product is free of defects in both materials and workmanship for a period of 3 years as defined herein for parts and labor from date of purchase. Motorized mechanical parts (Hard Drives, DVD, etc), mechanical parts (buttons, doors, etc), remotes and cables are covered for a period of 1 year. Batteries are not covered by this warranty. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with same or similar model) at our option without charge for parts or labor for the specified product warranty period.

This warranty shall not apply if any of the following:

A) The product has been damaged by negligence, accident, lightning, water, act-of-God or mishandling; or,

B) The product has not been operated in accordance with procedures specified in operating instructions: or,

C) The product has been repaired and or altered by other than manufacturer or authorized service center; or,

D) The product's original serial number has been modified or removed: or,

E) External equipment other than supplied by manufacturer, in determination of manufacturer, shall have affected the performance, safety or reliability of the product.

F) Part(s) are no longer available for product.

In the event that the product needs repair or replacement during the specified warranty period, product should be shipped back to Manufacturer at Purchaser's expense. Repaired or replaced product shall be returned to Purchaser by standard shipping methods at Manufacturer's discretion. Express shipping will be at the expense of the Purchaser. If Purchaser resides outside the contiguous US, return shipping shall be at Purchaser's expense.

No other warranty, express or implied other than Manufacturer's shall apply.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to a malfunction of the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage.

This product warranty extends to the original purchaser only and will be null and void upon any assignment or transfer.

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